

THE GENUS *CUSPIDARIA* (PELECYPODA: SEPTIBRANCHIA: CUSPIDARIIDAE) FROM THE DEEP SEA OF CAMPOS BASIN, BRAZIL, WITH DESCRIPTIONS OF TWO NEW SPECIES

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ABSTRACT

A revision of the members of *Cuspidaria* present on the continental slope (700–2,000 m) of the Campos Basin (22°S) off southeastern Brazil was carried out. Eight taxa are recognized. Two of them were previously unknown to science and are described here: ***Cuspidaria tamanca***, n. sp., and ***Cuspidaria wapixana***, n. sp. Three species are recorded from Brazilian waters for the first time: *Cuspidaria papyria* Jeffreys, 1876, a poorly described species that is here redescribed; *Cuspidaria wollastonii* Smith, 1885; and *Cuspidaria* cf. *barnardi* Knudsen, 1970. The geographic distribution is enlarged northwards for *Cuspidaria platensis* (Smith, 1885) and southwards for *Cuspidaria monosteira* Dall, 1890. *Cuspidaria circinata* (Jeffreys, 1876) was previously reported for Brazil, but the present record fills a gap in its distribution in the southwest Atlantic. *Bathynearea globulosa* Krylova, 1993, is here considered a junior synonym of *C. monosteira*; *Cuspidaria consociata* (Smith, 1885) and *Cuspidaria munieri* Dautzenberg & Fischer, 1897, are both considered junior synonyms of *C. circinata*. A list of all *Cuspidaria* species recorded for the Atlantic Ocean is given.

Key words: Pelecypoda, Septibranchia, Cuspidariidae, *Cuspidaria*, biodiversity, Brazil.

INTRODUCTION

The Cuspidariidae are often found in the deep sea, and are one of the largest families of pelecypods in this environment in the Atlantic Ocean (Allen, 2008: 59). The shell is thin and small, about 10 mm long, although larger species are known (e.g., *Cuspidaria wollastonii* Smith, 1885). The outline is strongly inequilateral, usually very rostrate, and the hinge is typically edentulous or has secondary teeth.

Knowledge of the number of species in this family grew rapidly in the 19th and 20th centuries, and several Recent species have been described for the Atlantic Ocean. Nevertheless, despite the importance of the Cuspidariidae in the deep sea and efforts of several authors (e.g., Jeffreys, 1881; Smith, 1885; Dall, 1886; Verrill & Bush, 1898; Knudsen, 1970, 1982, 2005; Allen & Morgan, 1981; Krylova, 1993, 1994, 1995; Poutiers & Bernard, 1995; Oliveira & Absalão, 2009), the taxonomy of this family is still poorly resolved. As part of a continuing effort to contribute to knowledge of the taxonomy of the deep sea septibranchs, this article describes

the results of a taxonomic revision of the genus *Cuspidaria*, family Cuspidariidae, from the Campos Basin off Rio de Janeiro state, Brazil.

MATERIALS AND METHODS

The samples were taken on the continental slope of Brazil, Rio de Janeiro state, off Campos Basin (22°S, 41°W), at depths from 700 to 1,950 m, between 2001 and 2003. The samples were taken with a 0.25 m² box corer, from the Research Vessel “Astro-Garoupa” as part of the program “Environmental Characterization of Campos Basin, RJ, Brazil” under the auspices of PETROBRAS S.A.

Each sample was washed through a 0.5 mm mesh, and preserved in 70% ethanol. Most of the shells were in a good state of conservation, but no live specimens were found. Each species was photographed under a scanning electron microscope (ZEISS EVO 40), at the Gerência de Bioestratigrafia e Paleoecologia Aplicada (BPA), of the Petrobrás Research Center (Centro de Pesquisas da Petrobrás – CENPES).

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In most cases, the original illustration and/or description were sufficient to identify the taxon. When they were not, we compared our specimens against the types and other specimens deposited in: The Natural History Museum, London (NHMUK), Musée Océanographique de Monaco (MOM), Smithsonian National Museum of Natural History (USNM), and Zoological Museum of Moscow State University (ZMMU).

For each species treated here, under *Distribution*, only those authors who increased the known geographical distribution are included. Authors who merely repeated previous records are not cited.

The specimens from the present study are deposited in the Mollusca collection of the following institutions: Departamento de Zoologia, Instituto de Biologia, Universidade Federal do Rio de Janeiro (IBUFRJ), Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), Museu de Zoologia, Universidade de São Paulo (MZSP), Museu Oceanográfico "Prof. Eliezer Rios" Universidade Federal do Rio Grande (MOFURG), Muséum National d'Histoire Naturelle, Paris (MNHN) and Museum of Comparative Zoology, Harvard University (MCZ).

RESULTS AND DISCUSSION

Family Cuspidariidae Dall, 1886

Type Genus: *Cuspidaria* Nardo, 1840 (synonym: *Neaera* Gray, 1834).

Diagnosis: Shell medium-sized, usually thin, inequilateral, rounded anteriorly, posterior margin usually with a strong rostrum. Slightly inequivalve, left valve larger. External ornamentation variable: smooth, granulated, or commarginally and/or radially ornamented. Hinge feeble, resilifer small, teeth absent or secondarily present. Description adapted from Dall (1886), Keen (1969), Allen & Morgan (1981) and Poutiers & Bernard (1995).

Remarks: Most taxa now placed in the family Cuspidariidae were once allocated to other families (e.g., Corbulidae Lamarck, 1818, and Myidae Lamarck, 1809). After the work of Smith (1885), Dall (1886) described the new family Cuspidariidae, also proposing new taxa (e.g., *Myonera* Dall & Smith, 1886) and transferring other previously known taxa to this new family (e.g., *Cuspidaria*; *Cardiomya* A. Adams, 1864). Several new genera have been de-

scribed more recently (e.g., *Octoporia* Scarlato & Starobogatov, 1983; *Protocuspidaria* Allen & Morgan, 1981). However, the phylogenetic relationships among them remain poorly resolved (Oliveira & Absalão, 2009), and the genera are in need of reevaluation.

Genus *Cuspidaria* Nardo, 1840

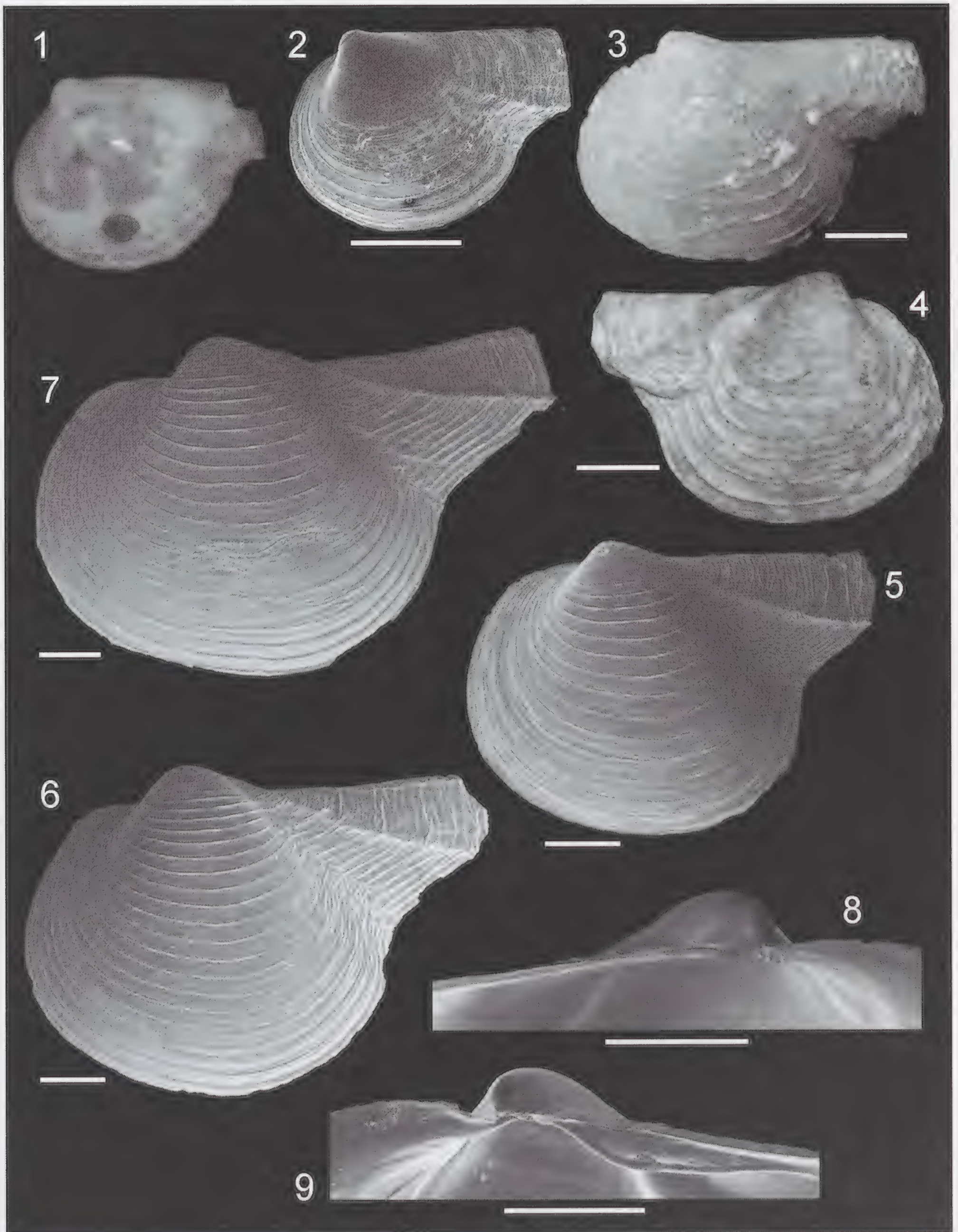
Type Species: *Tellina cuspidata* Olivi, 1792, a senior synonym of *Cuspidaria typus* Nardo, 1840, by monotypy.

The heterogeneity and the morphological diversity among species now included in *Cuspidaria* surpass the limits imposed by the current concept of this genus. For this reason, we have adapted the generic diagnosis below in order to allow the accommodation of most of the known species of the genus until a formal complete revision is conducted.

Diagnosis: Shell thin, slightly convex, slightly inequivalve, left valve usually larger. Inequilateral, posteriorly rostrate, rostrum length variable. Externally ornamented, usually by commarginal striae, lines, or cords; a primary and secondary rostral ridge may be present. Hinge feeble, resilifer small, teeth absent or present at least on right valve. Diagnosis adapted from Nardo (1840), Dall (1886), Keen (1969), Allen & Morgan (1981), Poutiers & Bernard (1995).

Remarks: This genus has a somewhat complicated history since the first *Cuspidaria* species were described in *Neaera* Gray, 1839. Later, Nardo (1840) established the genus *Cuspidaria*, a junior synonymy of *Neaera* Gray; however, the name *Neaera* Gray proved to be preoccupied by *Neaera* Robineau-Desvoidy, 1830 (Diptera). Dall (1886) was the first one to deal with this problem and, because the *Neaera* was preoccupied, he transferred its species to *Cuspidaria*.

This is the largest genus in Cuspidariidae, with more than a hundred described species and several different proposals for the subgeneric classification, most of them based on hinge features (e.g., presence or absence of teeth at right valve) and shell ornamentation (e.g., presence or absence of commarginal or radial ribs). On the other hand, several groups recently treated at generic level among cuspidariids, were previously recognized as subgenera or sections of *Cuspidaria* (e.g., *Cardiomya*; *Leiomya* A. Adams, 1864). More-



FIGS. 1–9. *Cuspidaria circinata* (Jeffreys, 1876), growth series. FIG. 1: *Cuspidaria consociata* (Smith, 1885), type (NHMUK 2003.0607); FIG. 2: *C. circinata*, ordinary specimen (IBUFRJ 18822); FIG. 3: *Cuspidaria muniere* Dautzenberg & Fischer, 1897, type (MOM); FIG. 4: *C. circinata*, type (USNM 63961); FIG. 5: *C. circinata*, ordinary specimen (IBUFRJ 18818); FIG. 6: *C. circinata*, ordinary specimen (IBUFRJ 18824); FIG. 7: *C. circinata*, ordinary specimen (IBUFRJ 18815); FIG. 8: *C. circinata*, ordinary specimen (IBUFRJ 18823); FIG. 9: *C. circinata*, ordinary specimen (IBUFRJ 18813). Scale bars: FIG. 1 no scale; FIGS. 2–9 = 1 mm.

over, there are species originally described in the genus *Cuspidaria* but considered in another combination later. For instance, *Cuspidaria acutecarinata* Dautzenberg & Fischer, 1906, and *Cuspidaria centobi* Bouchet & Warén, 1979, are now allocated to *Myonera*. To avoid confusion, we are using only the genus *Cuspidaria* for the deep Atlantic Ocean species and, for the authors who have used subgeneric classification, only those species included in the subgenus *Cuspidaria* s.s.

There are 51 known species of *Cuspidaria* previously recorded in the Atlantic Ocean: *C. cuspidata* (Olivi, 1792); *C. rostrata* (Spengler, 1793); *C. obesa* (Lovén, 1846); *C. jugosa* (S. V. Wood, 1850); *C. pellucida* (Stimpson, 1853); *C. arctica* (M. Sars, 1859); *C. papyria* (Jeffreys, 1876); *C. exigua* (Jeffreys, 1876); *C. circinata* (Jeffreys, 1876); *C. subtorta* (G. O. Sars, 1878); *C. lamellosa* (G. O. Sars, 1878); *C. glacialis* (G. O. Sars, 1878); *C. arcuata* (Dall, 1881); *C. jeffreysi* (Dall, 1881); *C. sulcifera* (Jeffreys, 1882); *C. gracilis* (Jeffreys, 1882); *C. bicarinata* (Jeffreys, 1882); *C. contracta* (Jeffreys, 1882); *C. undata* (Verrill, 1884); *C. consociata* (Smith, 1885); *C. azorica* (Smith, 1885); *C. capensis* (Smith, 1885); *C. kerguelensis* (Smith, 1885); *C. wollastonii* (Smith, 1885); *C. platensis* (Smith, 1885); *C. microrhina* Dall, 1886; *C. monosteira* Dall, 1890; *C. maxima* Dautzenberg & Fischer, 1897; *C. munieri* Dautzenberg & Fischer, 1897; *C. formosa* Verrill & Bush, 1898; *C. fraterna* Verrill & Bush, 1898; *C. media* Verrill & Bush, 1898; *C. ventricosa* Verrill & Bush, 1898; *C. turgida* Verrill & Bush, 1898; *C. parva* Verrill & Bush, 1898; *C. semirostrata* Locard, 1898; *C. imbricata* (Locard, 1898); *C. tenella* Smith, 1907; *C. plicata* Thiele, 1912; *C. concentrica* Thiele, 1912; *C. infelix* Thiele, 1912; *C. braziliensis* Smith, 1915; *C. guineensis* Knudsen, 1970; *C. barnardi* Knudsen, 1970; *C. atlantica* Allen & Morgan, 1981; *C. multicostata* Egorova, 1993; *C. minima* (Egorova, 1993); *C. smirnovi* Egorova, 1998; *C. luymesi* Knudsen, 2005; *C. altenai* Knudsen, 2005; *C. meteoris* Krylova, 2006.

From all these species, only six were previously registered for Brazil: *C. monosteira* (by Dall, 1890), *C. braziliensis* (by Smith, 1915), *C. parva* and *C. circinata* (both by Allen & Morgan, 1981), *C. platensis* (by Figueiras & Sicardi, 1980), *C. rostrata* (by Rios, 1994). Among them, *C. braziliensis* must be re-allocated in genus *Plectodon* Carpenter, 1864, because it has an external surface covered by small granules (Pimpão et al., 2010).

Cuspidaria circinata (Jeffreys, 1876)
(Figs. 1–13)

Neaera circinata Jeffreys, 1876: 497–498.

Neaera circinata: Jeffreys (1881: 942, pl. 71, fig. 6); Smith (1885: 42, pl. 10, fig. 4–4b).

Cuspidaria circinata: Dautzenberg (1889: 87); Dautzenberg & Fischer (1897: 222); Locard (1898: 185; 1899: 128); Dautzenberg (1927: 338); Allen & Morgan (1981: 459–460, fig. 25); Poutiers & Bernard (1995: 149, 158); Salas (1996: 74, figs. 125–126); Scarabino (2003: 238); Allen (2008: 79, 113, 117, 120).

Neaera consociata Smith, 1885: 41, pl. 9, fig. 7, 7b.

Cuspidaria consociata: Knudsen (1982: 131–132, 138, figs. 10, 11); Poutiers & Bernard (1995: 149, 158).

Cuspidaria munieri Dautzenberg & Fischer, 1897: 225–226, pl. 7, figs. 5, 6.

Cuspidaria munieri: Dautzenberg (1927: 339, pl. 9, figs. 5, 6).

Description: Shell white, small (height, 1.5–5.5 mm; length, 2.5–9.0 mm), elongate, inequivalve, inequilateral, rostrate, very convex, umbo large, prosogyric. Rostrum slender, long. Posterior margin straight, posteroventral sinuation marked, ventral and anterior margins rounded, anterodorsal margin forming a shoulder. Externally ornamented usually by up to 15 commarginal cords and countless growth lines; rostrum with two rostral ridges, one diagonal and another almost parallel to posterodorsal margin. Micropits present only on the interdissoconch. Hinge of left valve edentulous, right valve with strong posterior teeth. Resilifer slender, deep.

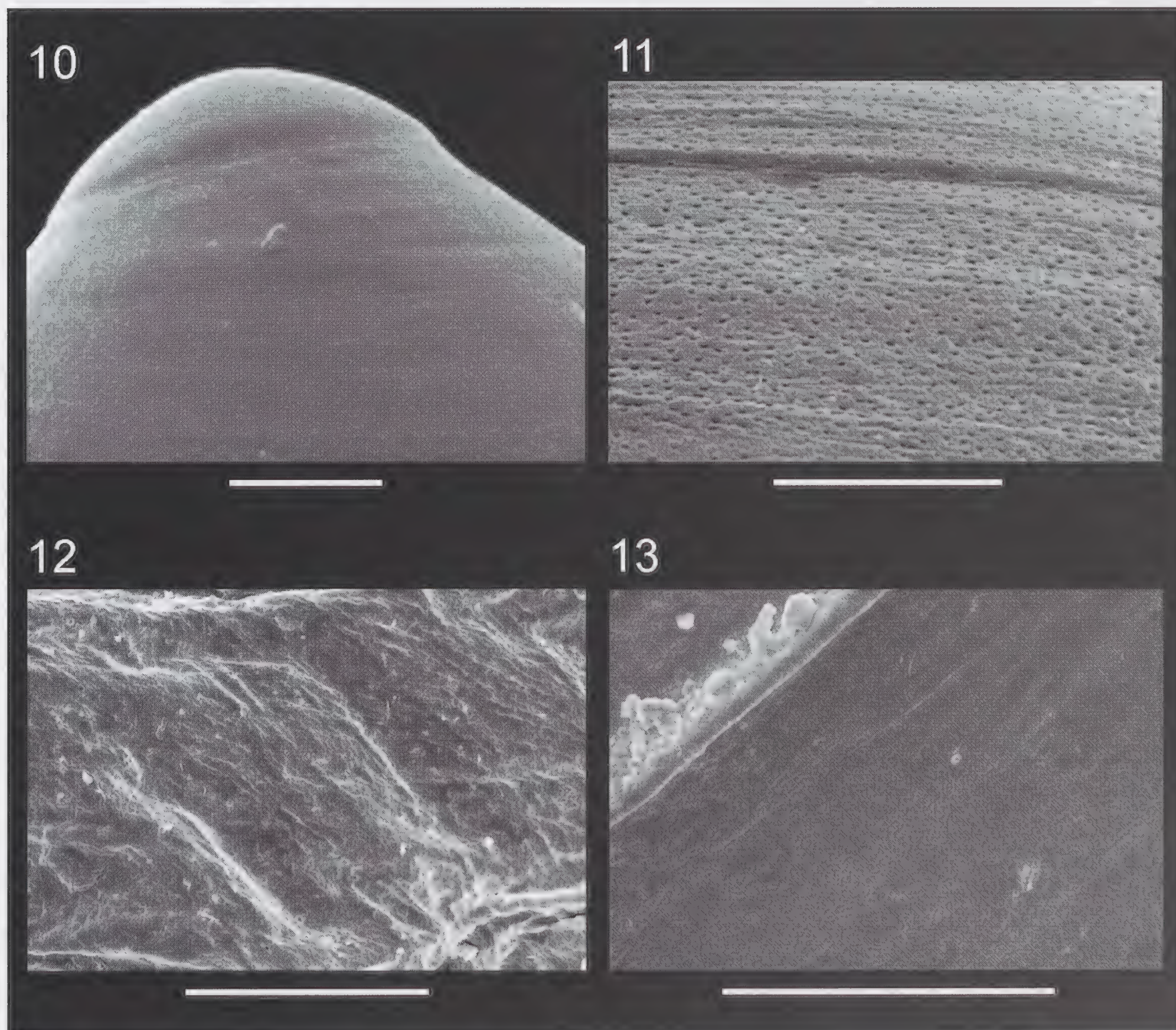
Type Locality: SE of Greenland, “Valorous” Expedition, sta. 12 (56°11’N, 37°41’W), 2,652 m, off Portugal, “Porcupine” Expedition 1870, sta. 16 (39°55’N, 9°56’W), 1,818 m.

Distribution: Atlantic Ocean: northwestern Atlantic: SE of Greenland (Jeffreys, 1876); off Bermuda, NE of Culebra Island, West Indies (Smith, 1885); Saba Bank (Knudsen, 1982). Southwestern Atlantic: Brazil: off Pernambuco (Allen & Morgan, 1981); off Campos Basin, Rio de Janeiro state (present study). Off Uruguay (Allen & Morgan, 1981). Northeastern Atlantic: off Isla de la Palma, Canary Islands (Smith, 1885); W of Marroc (Locard, 1898); W of the Strait of Gibraltar (Salas, 1996); off Portugal (Jeffreys, 1876, 1881); Azores and W of Azores (Jeffreys, 1881;

Smith, 1885; Dautzenberg & Fischer, 1897); Bay of Biscay (Jeffreys, 1881; Locard, 1898; Allen & Morgan, 1981); SE of Ireland (Allen & Morgan, 1981); NW of Ireland (Jeffreys, 1881). Bathymetry: from 340 m (Knudsen, 1982) to 4,382 m (Allen & Morgan, 1981).

Material Examined: IBUFRJ 18812 (22°09'10"S, 39°44'50"W, 1,930 m), 08.V.02 [1 valve]; IBUFRJ 18813 (22°11'16"S, 39°43'44"W, 1,950 m), 25.XI.02 [1 valve]; IBUFRJ 18814 (22°46'59"S, 40°07'49"W, 1,650 m), 22.XI.02 [1 valve]; IBUFRJ 18815 (22°41'35"S, 40°00'45"W, 1,950 m), 22.XI.02 [1 valve]; IBUFRJ 18816, (22°31'28"S, 40°03'50"W, 1,050 m), 19.XI.02 [1 valve]; IBUFRJ 18817 (22°24'31"S, 39°57'28"W, 1,050 m), 20.XI.02 [1 valve]; IBUFRJ 18818 (22°11'16"S,

39°43'44"W, 1,950 m), 22.VI.03 [1 valve]; IBUFRJ 18819 (22°04'45"S, 39°41'58"W, 1,950 m), 27.VI.03 [1 valve]; IBUFRJ 18820 (21°52'59"S, 39°55'32"W, 750 m), 29.VI.03 [3 valves]; IBUFRJ 18821 (22°41'31"S, 40°00'47"W, 1,950 m), 06.XII.03 [1 valve]; IBUFRJ 18822 (22°31'28"S, 40°03'49"W, 1,050 m), 18.VI.03 [1 valve]; IBUFRJ 18823 (22°37'02"S, 39°56'20"W, 1,950 m), 13.VI.03 [1 valve]; IBUFRJ 18824 (22°31'37"S, 39°55'14"W, 1,650 m), 16.VI.03 [2 valves]; *C. consociata*: types: NHMUK 2003.0607, off Bermuda, 795 m; NHMUK 1887.2.9.2406-7, off Culebra Island, West Indies, 713 m, destroyed by Byne's disease; *C. munieri*: type: MOM, off Azores, 1,846 m; *C. circinata*: type: USNM 63960, NW of Ireland, 1,214 m, fragmented; USNM 63961, off Portugal, 1,818 m.



FIGS. 10–13. *Cuspidaria circinata* (Jeffreys, 1876). FIG. 10: IBUFRJ 18822, punctate surface towards the umbo; FIG. 11: IBUFRJ 18823, interdissoconch with micropits; FIGS. 12, 13: IBUFRJ 18813, rostrum and anterior margin details, respectively. Scale bars = 100 µm.

Discussion: *Cuspidaria circinata* varies in outline during its ontogeny. The shell becomes more convex, and the prodisso- and the interdissoconch become progressively more enclosed and eventually hidden by the teleoconch, and the anterior margin becomes more rounded and prominent. Because the micropits are restricted to the interdissoconch, in adult specimens, they are visible only at the top of the shell. We have been able to examine the type specimens of *C. consociata* in the British Museum [NHMUK 1887.2.9.2406-7, destroyed by Byne's disease], and an additional preserved specimen [NHMUK 2003.0607] that is a very good fit to the concept of this species.

The preserved specimen (Fig. 1) of *C. consociata* is very similar to the young stages of *C. circinata*, and also, as noted by Smith (1885: 41), *C. consociata* "presents a minutely punctate surface towards the umbo, both within and without". At this time, we regard Smith's specimens "without punctate surface" as an effect caused by observation through optical microscopy, because, in observing our material under an optical microscope, we did not see the micropits in some specimens (Oliveira & Absalão, 2009), although it was visible under scanning electron microscopy. Therefore, since *C. consociata* shows no differences from the young stages of *C. circinata*, and additionally, considering the change in outline and external ornamentation observed for *C. circinata*, we consider these two species to be synonyms.

The specimen illustrated as *C. consociata* by Knudsen (1982: figs. 10, 11) has a longer posterior lateral tooth on the right valve. At this time, we consider this difference to be an individual variation.

Cuspidaria munieri Dautzenberg & Fischer, 1897, described based on a single left valve with an edentulous hinge, from the Azores at 1,846 m, is also quite similar to *C. circinata*, an opinion shared with Allen & Morgan (1981: 459). After examining a photograph of the type specimens of *C. munieri* (Fig. 3), and considering the variation in the growth series of our specimens, we propose this latter species as a junior synonym of *C. circinata*.

Cuspidaria circinata can be distinguished from two other similar Atlantic commarginally ornamented species, *C. concentrica* and *C. minima*, in the presence in *C. circinata* of a marked posteroventral sinuation, a longer dorsoventral axis, and a well-developed hinge plate on the anterior region, which forms a

shoulder at the anterodorsal margin viewed externally. Such features are absent in *C. concentrica* and *C. minima*. Both species have a more elongate outline, a less-marked posteroventral sinuation, and no hinge plate developed on the anterior side. *Cuspidaria minima* also differs from *C. circinata* in the presence of a posterior lateral tooth on the left valve of the former.

Cuspidaria (?) *monosteira* Dall, 1890
(Figs. 14–23)

Cuspidaria (?) *monosteira* Dall, 1890: 281, pl. 8, fig. 5.

Verticordia monosteira: Knudsen (1982: 126, figs. 2, 3); Poutiers & Bernard (1995: 142, 163).

Bathyneaea globulosa Krylova, 1993: 55, fig. 11–L.

Cuspidaria monosteira: Rios (1994: 303, fig. 1480; 2009: 605, fig. 1675).

Description: Shell white, small (height, 3.7 mm; length, 3.8 mm), triangular, inequilateral, rostrate, very convex, umbo large, central. Rostrum short. Posterodorsal margin strongly oblique, descending, posteroventral sinuation marked, confined by the rostral ridge and by a strong radial keel extending from the umbo to the lower point of the "V"-shaped ventral margin, anteroventral margin slightly curved upwards, anterodorsal margin almost vertical. Externally ornamented with several commarginal growth lines and incomplete commarginal ribs on anterior margin, these ribs more pronounced near anteroventral margin. Micropits absent. Hinge edentulous, left valve with a projection of the posterior hinge plate. Resilifer triangular, deep.

Type Locality: U.S. Fish Commission sta. 2760, off north of Bahia, Brazil (12°7'S, 37°17'W, 1,864 m).

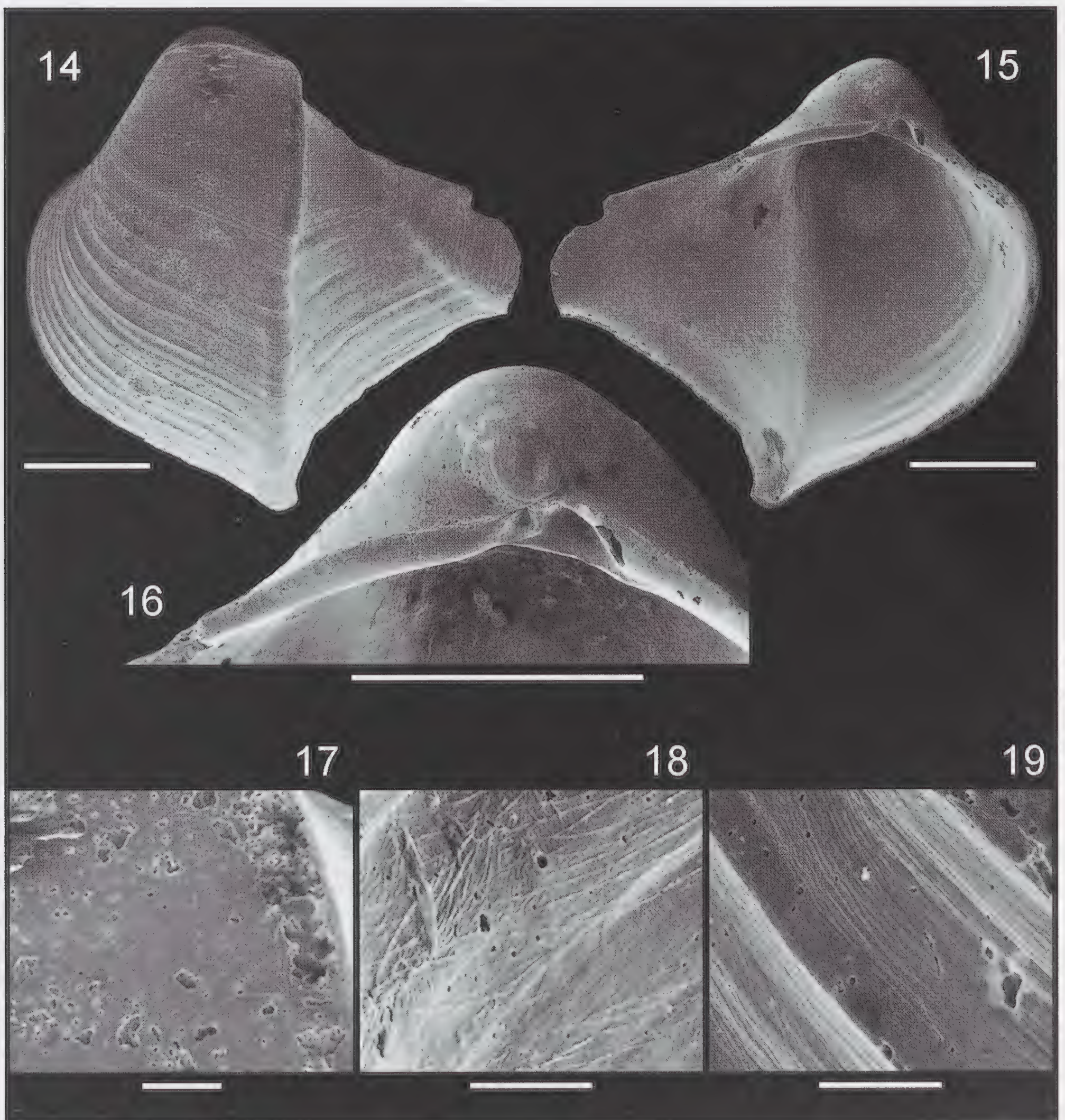
Distribution: Atlantic Ocean: northwest Atlantic: E of Yakutat Seamount (Krylova, 1993). Saba Bank (Knudsen, 1982). Southwest Atlantic: Brazil: N of Bahia (Dall, 1890), off Campos Basin, Rio de Janeiro state (present study). Bathymetry: from 850 m (Knudsen, 1982) to 4,480 m (Krylova, 1993).

Material Examined: IBUFRJ 18772 (21°58'36"S, 39°46'30"W, 1,700 m), 08.X.01 [1 valve]; *C. monosteira*: Holotype: USNM 95457 (type locality); *B. globulosa*: Holotype: ZMMU 2860, east of Yakutat Seamount, 4,440–4,480 m.

Discussion: This very rare species, with only two valves under the name *C. monosteira* previously reported in the literature (i.e., Dall, 1890; Knudsen, 1982), was wrongly reported in the original description as “90 miles north from Ceara” but the coordinates actually indicate a location off the state of Bahia, Brazil. This error was followed by subsequent authors (e.g., Rios, 2009).

As reported by Krylova (1993: 55), *Bathyneuera globulosa* Krylova, 1993, and *C.*

monosteira are conchologically very similar, the diagnostic character being the absence of hinge teeth in the former. Upon initial examination, *C. monosteira* appears to have a long “posterior lateral tooth”, as described by Dall (1890: 281), but actually this seems to be merely a concave projection of the hinge plate, not a real tooth (Fig. 16). We have been able to examine the type specimen of *B. globulosa* (Figs. 20–23). It agrees perfectly with the concept of *C. monosteira*, and the

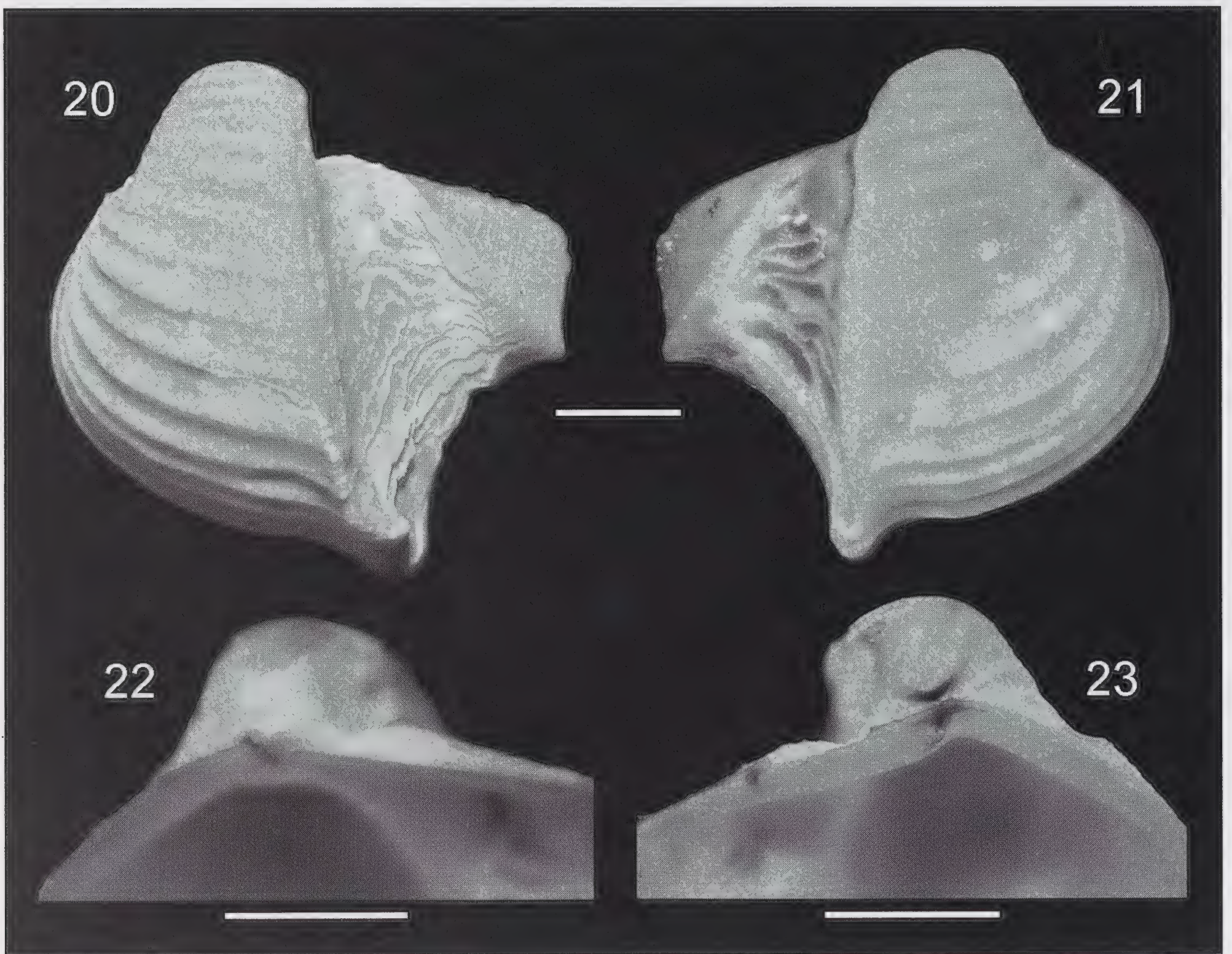


FIGS. 14–19. *Cuspidaria monosteira* Dall, 1889, IBUFRJ 18772. FIGS. 14, 15: External and internal view; FIG. 16: Hinge detail; FIGS. 17–19: Umbo, rostrum and anterior margin details, respectively. Scale bars: FIGS. 14–16 = 1 mm, FIG. 17 = 200 μ m, FIGS. 18, 19 = 100 μ m.

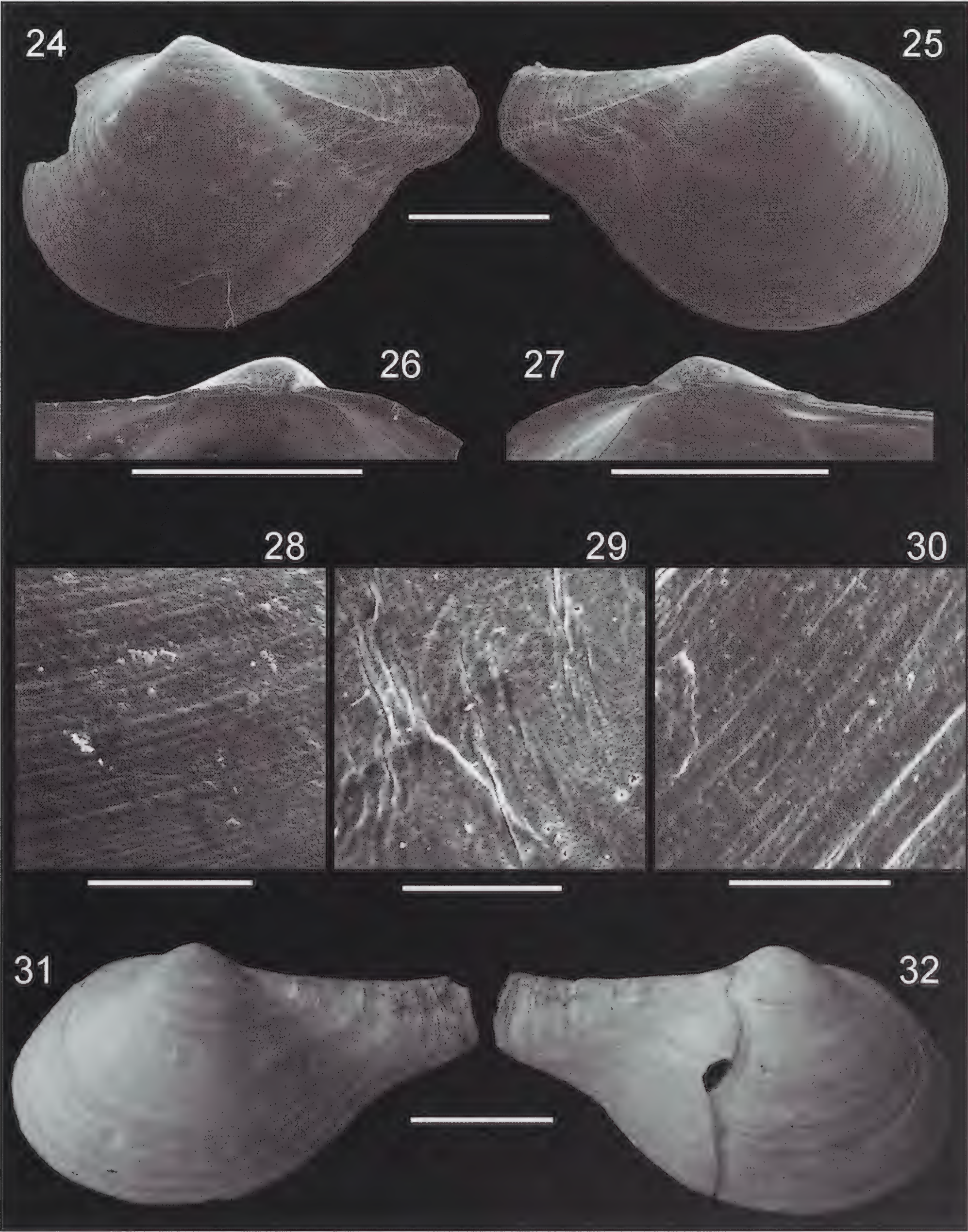
“absence of tooth” attributed to *B. globulosa* is caused merely by a thicker posterior hinge plate, which eliminates the concave appearance. Thus, the “presence” or “absence” of the posterior tooth may be regarded as a simple variation in the thickness of the hinge plate, and therefore we consider *B. globulosa* to be a junior synonym of *C. monosteira*.

The presence of *C. monosteira*, a very distinct species, in the genus *Cuspidaria* requires particular discussion. This species shows characteristics of several different genera, and it is difficult to convincingly allocate it to any currently valid genus. Dall (1890: 281) made clear his doubts about this subject when he utilized the symbol “?” in the description of *C. monosteira*. Knudsen (1982: 126) allocated *C. monosteira* to the genus *Verticordia* Sowerby, 1844; however, “the presence of a rostrum at the posterior

margin and two radial keels, as well as the absence of a lunule [...] do not support the allocation of this species to the genus *Verticordia*.” (Oliveira & Absalão, 2010: 811). Krylova (1993: 55) allocated *B. globulosa* (a junior synonym of *C. monosteira*) to the genus *Bathyneaera*, but this species has two very strong radial keels that interrupt the more-or-less-continuous outline observed for the genus *Bathyneaera*; and additionally, the concept of this genus states that all members should be elliptical in outline with an external surface adorned by a mesh of commarginal and radial ornamentation – characters that are absent in *B. globulosa*. Thus, considering that the creation of new supraspecific taxa in a group (Cuspidariidae) that is still poorly taxonomically resolved would be worthless, we opt to provisionally retain *C. monosteira* in its original combination.



FIGS. 20–23. *Bathyneaera globulosa* Krylova, 1993, holotype (ZMMU 2860). FIG. 20: External view, left valve; FIG. 21: External view, right valve; FIGS. 22, 23: Hinge details, right and left valve, respectively. Scale bars = 1 mm.



FIGS. 24–30. *Cuspidaria platensis* (Smith, 1885), IBUFRJ 18777. FIG. 24: External view, left valve; FIG. 25: External view, right valve; FIGS. 26, 27: Hinge details, left and right valve, respectively; FIGS. 28–30: Umbo, rostrum and anterior margin details, respectively; FIGS. 31, 32: *Cuspidaria platensis* (Smith, 1885), type (NHMUK 1887.2.9.2417). Scale bars: FIGS. 24–27 = 2 mm, FIGS. 28–30 = 100 µm, FIGS. 31, 32 = 4 mm.

Cuspidaria platensis (Smith, 1885)
(Figs. 24–32)

Neaera platensis Smith, 1885: 45, pl. 9, fig. 4–4b.

Cuspidaria platensis: Figueiras & Sicardi (1980: 156–157, pl. 2, fig. 19); Rios (1994: 303, pl. 104, fig. 1481); Poutiers & Bernard (1995: 149, 165); Scarabino (2003: 238).

Description: Shell white, small (height, 2–4 mm; length, 3–6 mm), elongate, inequivalve, inequilateral, rostrate, convex. Umbo large, prosogyrate. Rostrum long. Posterodorsal margin slightly curved upwards, posteroventral sinuation little marked, ventral and anterior margin rounded, anterodorsal margin slightly extended horizontally just after the umbo. Externally ornamented with indistinct commarginal growth lines, rostral ridge may be present, few radial striae present on rostrum. Micropits absent. Hinge of left valve edentulous, right valve with strong and posteriorly elongate lateral teeth. Resilifer elongate, deep.

Type Locality: Off the mouth of the Rio de la Plata, 1,097 m.

Distribution: Atlantic Ocean: southwestern Atlantic: Brazil: off Campos Basin, Rio de Janeiro state (present study); Tramandaí, Albardão, Rio Grande do Sul (Figueiras & Sicardi, 1980). Uruguay: off the mouth of the Rio de la Plata (Smith, 1885; Figueiras & Sicardi, 1980); southern Brazil to Uruguay (Rios, 1994). Bathymetry: from 100 m (Figueiras & Sicardi, 1980) to 1,950 m (present study).

Material Examined: IBUFRJ 18774 (22°03'27"S, 39°45'07"W, 1,730 m), 08.V.02 [3 valves]; IBUFRJ 18776 (22°05'45"S, 39°45'55"W, 1,730 m), 09.V.02 [1 valve]; IBUFRJ 18775 (22°05'11"S, 39°42'40"W, 1,930 m), 08.V.02 [1 valve]; IBUFRJ 18773 (22°39'34"S, 40°08'22"W, 1,200 m), 15.V.02 [2 valves]; IBUFRJ 18777 (21°52'51"S, 39°48'11"W, 1,350 m), 12.XII.02 [2 valves]; IBUFRJ 18778 (22°41'35"S, 40°00'45"W, 1,950 m), 22.XI.02 [1 valve]; IBUFRJ 18779 (22°36'03"S, 39°57'54"W, 1,650 m), 16.XI.02 [2 valves]; IBUFRJ 18780 (22°04'45"S, 39°46'31"W, 1,650 m), 27.VI.03 [1 valve]; IBUFRJ 18781 (21°52'51"S, 39°48'12"W, 1,350 m), 26.VI.03 [1 valve]; IBUFRJ 18782 (21°52'41"S, 39°46'17"W, 1,650 m), 26.VI.03 [1 valve]; IBUFRJ 18783 (21°52'43"S, 39°40'41"W, 1,950 m), 26.VI.03 [1 valve]; IBUFRJ 18784 (22°27'31"S, 40°09'23"W, 750 m),

18.VI.03 [1 valve]; IBUFRJ 18785 (22°36'12"S, 39°58'22"W, 1,650 m), 13.VI.03 [1 valve]; IBUFRJ 18786 (22°28'46"S, 39°53'27"W, 1,650 m), 17.VI.03 [1 valve]; IBUFRJ 18787 (22°30'34"S, 39°51'44"W, 1,950 m), 16.VI.03 [3 valves]; *C. platensis*: type: NHMUK 1887.2.9.2417, off the mouth of the Rio de la Plata, 1,097 m.

Discussion: The material studied here is shorter than the types (Figs. 31, 32), and the rostral ridge is of variable strength in our material and is barely visible in the type. Nevertheless, we regard this divergence as a result of the difference in size between the types and our material.

Cuspidaria fraterna is indistinguishable from *C. platensis*, except in the absence of the rostral ridge in the former. Considering that this character may be more or less developed in different specimens of *C. platensis*, we have serious doubts about retaining both species as distinct.

Rios (2009) made reference to *C. platensis*, but the figured specimen (Rios, 2009: 606, fig. 1676) does not fit in the concept of this species. *Cuspidaria plantensis sensu* Rios (2009) differs from *C. platensis* in the presence, in the former, of a somewhat triangular shell, a strongly oblique anterodorsal margin, and no posteroventral sinuation.

Cuspidaria wollastonii (Smith, 1885)
(Figs. 33–40)

Neaera wollastonii Smith, 1885: 40, pl. 10, fig. 6–6b.

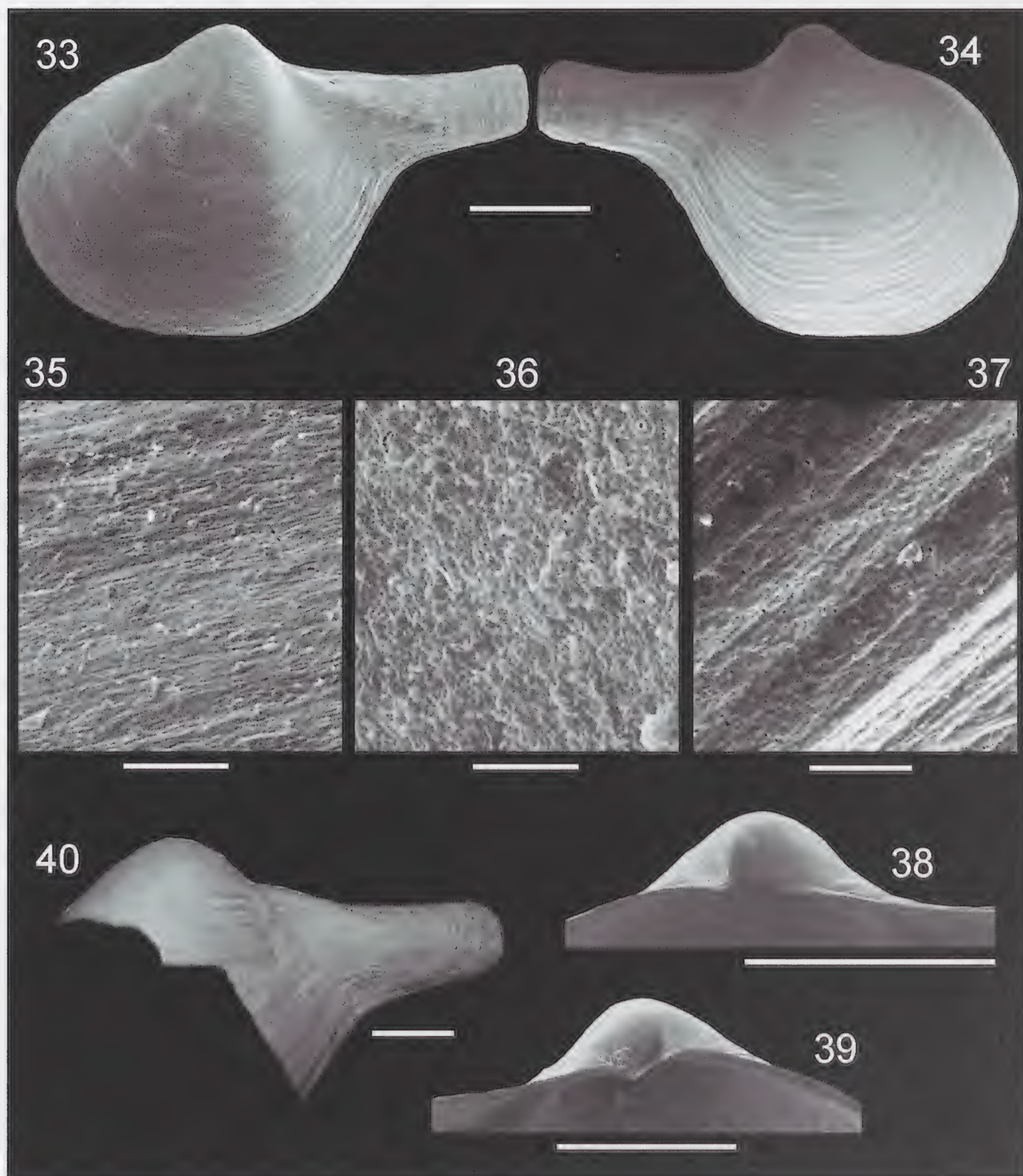
Cuspidaria wollastonii: Dautzenberg (1889: 87; 1927: 336–337); Dautzenberg & Fischer (1897: 221); Locard (1898: 171, pl. 8, figs. 6–11); Knudsen (1970: 220); Abbott (1974: 565); Poutiers & Bernard (1995: 149, 168).

Description: Shell white, small (height, 4–5 mm; length 8–9 mm), elongate, inequivalve, inequilateral, rostrate, very convex, umbo large, central. Rostrum slender, long. Posterodorsal margin slightly curved upwards, posteroventral sinuation well marked, ventral margin moderately straight, anterior margin rounded. Externally ornamented with commarginal growth lines, rostrum with about four radial striae. Micropits absent. Hinges of both valves edentulous. Resilifer elongate, deep.

Type Locality: W of Azores, 1,829 m.

Distribution: Atlantic Ocean: southeastern Atlantic: Brazil: off Campos Basin, Rio de Janeiro state (present study); northwestern Atlantic: off Morocco, off Gulf of Cadiz (Locard, 1898), off Azores (Smith, 1885; Dautzenberg, 1889,

1927; Dautzenberg & Fischer, 1897; Locard, 1898). Bathymetry: from 103 m to 3,175 m (Locard, 1898). Abbott (1974: 565) recorded this species from "1,000 fathoms, 32 miles southwest of Bermuda", but we were unable

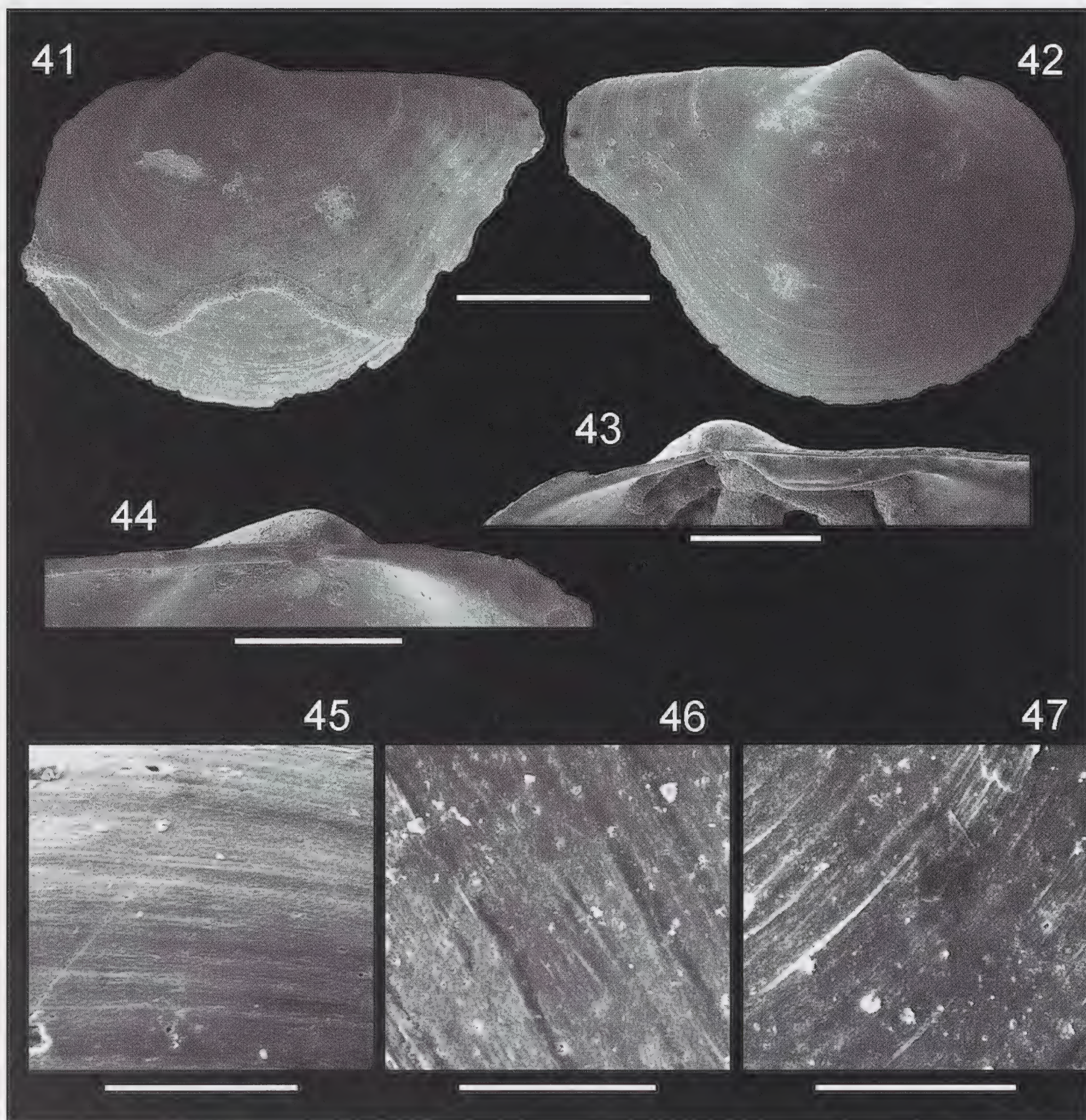


FIGS. 33–40. *Cuspidaria wollastonii* (Smith, 1885). FIG. 33: IBUFRJ 18806, external view, left valve; FIGS. 34–39: IBUFRJ 18807; FIG. 34: External view, right valve; FIGS. 35–37: Umbo, rostrum and anterior margin details, respectively; FIGS. 38, 39: Hinge details, right and left valve, respectively; FIG. 40: Type (NHMUK 1887.2.9.2405). Scale bars: FIGS. 33, 34, 38, 39 = 2 mm, FIGS. 35–37 = 20 µm, FIG. 40 = 4 mm.

to find this record in the literature. Knudsen (1970: 220) rejected depth records of 53 abyssal pelecypods, including the record of *C. wollastonii*, because they were based on empty shells. Up to the present, this species has been mentioned by only the five authors listed above. All of them recorded *C. wollastonii* for deep water, except Locard (1898) who recorded it from 103 to 3,175 m. Considering that there is no record of *C. wollastonii* with

soft parts from shallow waters and only one of five reports recorded this species outside the deep-water environment, we cannot reject the deep-water records.

Material Examined: IBUFRJ 18806 (22°06'52"S, 39°44'13"W, 1,930 m), 08.V.02 [1 valve]; IBUFRJ 18807 (22°06'52"S, 39°44'13"W, 1,930 m), 08.V.02 [1 valve]; IBUFRJ 18808 (22°04'45"S, 39°46'31"W, 1,650 m), 27.VI.03



FIGS. 41–47. *Cuspidaria* cf. *barnardi* Knudsen, 1970, IBUFRJ 18804. FIG. 41: External view, left valve; FIG. 42: External view, right valve; FIGS. 43, 44: Hinge details, right and left valve, respectively; FIGS. 45–47: Umbo, rostrum and anterior margin details, respectively. Scale bars: FIGS. 41, 42 = 2 mm, FIGS. 43, 44 = 1 mm, FIGS. 45–47 = 100 μ m.

[1 valve]; IBUFRJ 18809 (22°41'10"S, 40°02'20"W, 1,650 m), 13.VI.03 [1 valve]; *C. wollastonii*: type: NHMUK 1887.2.9.2405, W of Azores, 1,829 m.

Discussion: This type is broken but not destroyed (Fig. 40). The figure provided by Smith (1885, pl. 10, fig. 6–6b) is somewhat different from the type, because the rostrum is more elongate in Smith's figure. Considering that the type is composed of only one valve, we suppose that this difference can be attributed to the drawing.

Cuspidaria wollastonii is similar to *C. rostrata*, but it differs by the presence, in the former, of a more inflated shell, a shorter rostrum, and a somewhat quadrangular outline; whereas *C. rostrata* is more circular in outline and has a very long and slender rostrum.

The specimen illustrated by Salas (1996: 74, figs. 111, 112) under the name *C. wollastonii* does not fit in the concept of *C. wollastonii*. This specimen may eventually prove to be an extreme variation of *C. rostrata*, or even a new taxon.

Cuspidaria cf. *barnardi* Knudsen, 1970
(Figs. 41–47)

Cuspidaria barnardi Knudsen, 1970: 139–141, figs. 96, 97; Poutiers (1984: 287, pl. 17, fig. 4); Allen & Morgan (1981: 457–458, fig. 24); Poutiers & Bernard (1995: 148, 157); Scarabino (2003: 238); Allen (2008: 79, 95, 117, 161).

Description: Shell white, small (height, 4 mm; length, 5 mm), elongate, inequivalve, inequilateral, rostrate, little convex. Umbo small, central. Rostrum short. Dorsal margin straight, posteroventral sinuation little pronounced, ventral margin and anterior margin rounded. Externally ornamented only by commarginal growth lines. Micropits absent. Hinge of left valve edentulous, right valve with strong posterior teeth. Resilifer rounded, shallow.

Type Locality: Indian Ocean: off southeast Africa, 3,530 m

Distribution: Indian Ocean: off SE Africa (Knudsen, 1970), SE of Glorioso Islands (Poutiers, 1984). Atlantic Ocean?: North Atlantic: S of Martha's Vineyard, W of Guinea-Bissau (Allen & Morgan, 1981). Southwestern Atlantic: off Campos Basin, Rio de Janeiro state (present

study); off Uruguay (Allen & Morgan, 1981). Bathymetry: from 1,050 m (present study) to 3,828 m (Allen & Morgan, 1981).

Material Examined: IBUFRJ 18804 (22°04'33"S, 39°52'05"W, 1,050 m), 30.VI.03 [2 valves].

Discussion: The specimens collected in the present study show good agreement with the original concept of *C. barnardi* (Knudsen, 1970: 139–141, figs. 96, 97). The major difference between our material and the illustration of the type is the posterodorsal margin that is somewhat curved and slightly descending in our specimens, whereas the original illustration shows it as straight and horizontal. However, this difference may be a result of an old injury in our specimens, as noted by the shell scar in that region.

Nevertheless, despite their conchological similarity, considering that the type locality of *C. barnardi* is the Indian Ocean, we have identified this taxon with some uncertainty. Because there is as yet no convincing evidence about the geographic distribution of deep-sea septibranch species, we opted at this time to retain taxa from different oceans as potentially different species (Oliveira & Absalão, 2010).

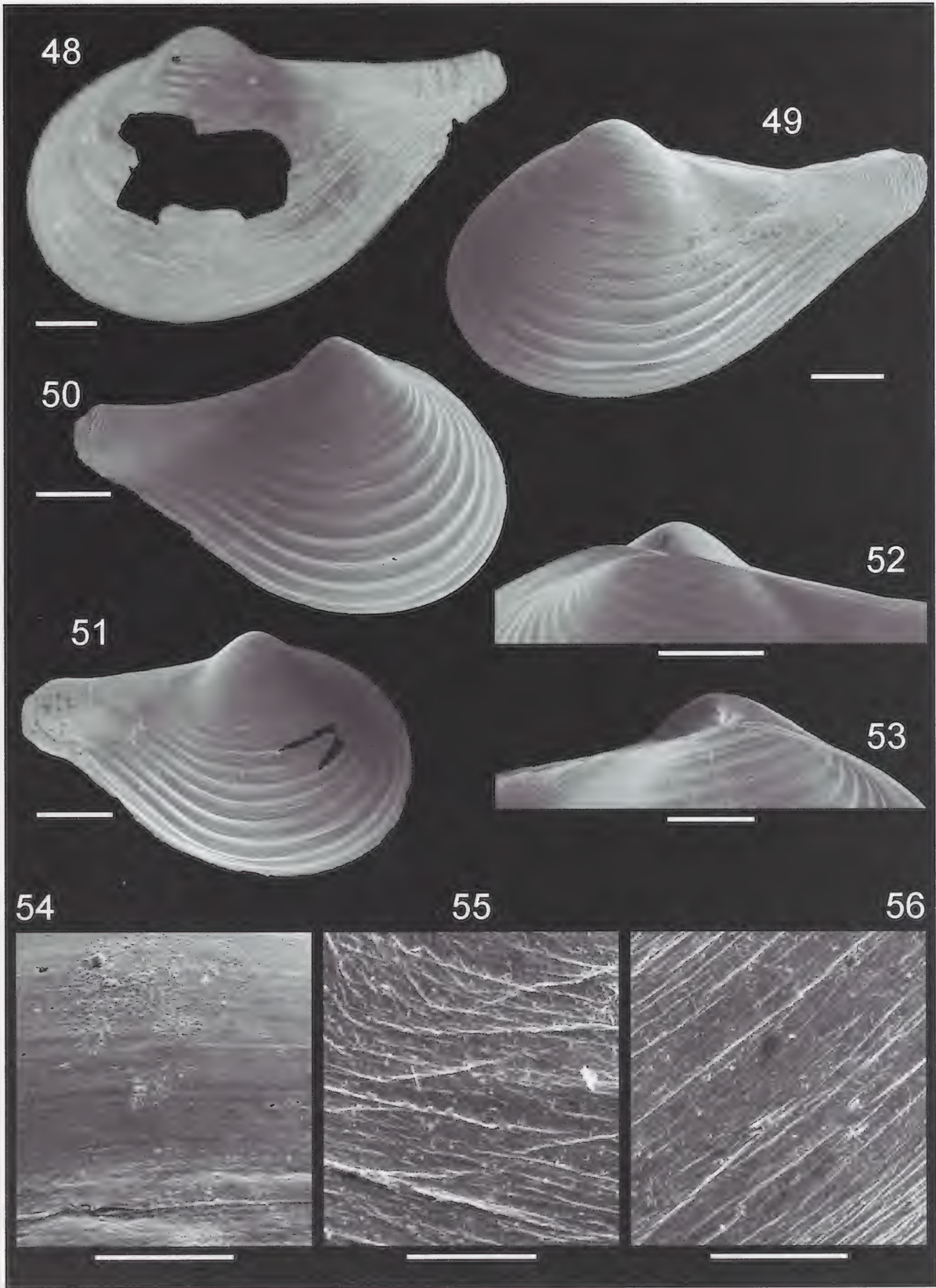
Cuspidaria papyria Jeffreys, 1876
(Figs. 48–56)

Neaera papyria Jeffreys, 1876: 498.

Cuspidaria? *papyria*: Poutiers & Bernard (1995: 164).

Redescription: Shell white, small (height, 2.0–4.5 mm; length, 4–8 mm), elongate, inequivalve, inequilateral, rostrate, convex. Umbo large, prosogyrous. Rostrum large, long. Posterodorsal margin curved upwards, posteroventral margin gently merging with ventral margin, posteroventral sinuation absent, anterior margin rounded, anterodorsal margin curved downwards immediately after the umbo. Shell with about 6–18 commarginal waves, internally perceptible. Externally ornamented with indistinct commarginal growth lines, several radial lines extending over the rostrum. Micropits absent. Hinge edentulous, small triangular process often present. Resilifer triangular, elongate, shallow.

Type Locality: "Valorous" Expedition, sta. 12, SE of Greenland (56°11'N, 37°41'W, 2,652 m).



FIGS. 48–56. *Cuspidaria papyria* Jeffreys, 1876. FIG. 48: Lectotype, USNM 63958, external view, left valve; FIG. 49: MNHN, external view, left valve; FIG. 50: MCZ 374245, external view, right valve; FIG. 51: MZSP 96913, external view, right valve; FIGS. 52, 53: Hinge details, right (MOFURG 51167) and left (MNRJ 18730) valves, respectively; FIGS. 54–56: IBUFRJ 18872, umbo, rostrum and anterior margin details, respectively. Scale bars: FIGS. 48–53 = 1 mm, FIGS. 54–56 = 100 μ m.

Distribution: Atlantic Ocean: Northwest Atlantic: SE of Greenland (Jeffreys, 1876). Southwest Atlantic: Brazil: off Campos Basin, Rio de Janeiro state (present study). Bathymetry: from 1,050 m (present study) to 2,652 m (Jeffreys, 1876).

Material Examined: IBUFRJ 18871 (21°58'36"S, 39°46'30"W, 1,700 m), 08.X.01 [2 valves]; IBUFRJ 18872 (22°05'11"S, 39°42'40"W, 1,930 m), 08.V.02 [1 valve]; IBUFRJ 18876 (22°04'46"S, 39°43'02"W, 1,950 m), 24.XI.02 [1 valve]; IBUFRJ 18877 (21°52'41"S, 39°46'17"W, 1,650 m), 11.XII.02 [2 valves]; IBUFRJ 18878 (21°52'44"S, 39°40'45"W, 1,950 m), 11.XII.02 [1 valve]; IBUFRJ 18879 (22°41'03"S, 40°02'29"W, 1,650 m), 23.XI.02 [1 spec.]; IBUFRJ 18880 (22°41'35"S, 40°00'45"W, 1,950 m), 22.XI.02 [2 valves]; IBUFRJ 18881 (22°31'28"S, 40°03'50"W, 1,050 m), 19.XI.02 [1 valve]; IBUFRJ 18882 (22°36'03"S, 39°57'54"W, 1,650 m), 16.XI.02 [2 valves]; IBUFRJ 18883 (22°28'49"S, 39°53'24"W, 1,650 m), 17.XI.02 [1 spec.]; IBUFRJ 18884 (22°33'10"S, 39°54'22"W, 1,950 m), 23.XI.02, [1 spec.]; IBUFRJ 18885 (22°11'16"S, 39°43'44"W, 1,950 m), 22.VI.03 [1 valve]; IBUFRJ 18886 (22°04'45"S, 39°41'58"W, 1,950 m), 27.VI.03 [3 valves]; IBUFRJ 18888 (22°41'31"S, 40°00'47"W, 1,950 m), 06.XII.03 [1 valve + 1 spec.]; IBUFRJ 18889 (22°31'28"S, 40°03'49"W, 1,050 m), 18.VI.03 [2 valves]; IBUFRJ 18890 (22°36'12"S, 39°58'22"W, 1,650 m), 13.VI.03 [1 valve]; IBUFRJ 18891 (22°28'46"S, 39°53'27"W, 1,650 m), 17.VI.03 [3 valves]; MNRJ 18730 (22°06'52"S, 39°44'13"W, 1,930 m), 08.V.02 [1 valve]; MZSP 96913 (22°48'05"S, 40°06'38"W, 1,950 m), 06.XII.03 [1 valve]; MOFURG 51167 (22°06'52"S, 39°44'13"W, 1,930 m), 08.V.02 [1 valve]; MCZ 374245 (22°48'05"S, 40°06'38"W, 1,950 m) 06.XII.03 [1 valve]; MNHN (22°05'11"S, 39°42'40"W, 1,930 m), 08.V.02 [1 valve].

Discussion: *Cuspidaria papyria* was poorly described and never figured. We have been able to examine the type series (USNM 63958), which is composed of several fragments and one broken valve (Fig. 48). The broken valve is very similar to our specimens and an appropriate description is given here.

Cuspidaria papyria has a distinct rippled appearance observed in only a very few species of *Cuspidaria*. It can be distinguished from *C. tenella* in the absence of conspicuous commarginal striae, and by the elongate outline, with a longer rostrum in the former. It is

noteworthy that, although the type specimen of *C. tenella* is broken (Zelaya & Ituarte 2006, fig. 29), the concept of *C. tenella* established by Dell (1990: 60, fig. 105) perfectly agrees with the fragmented type specimen and fits the original concept of this species.

Additionally, although Dell (1964, 1990) synonymized *C. tenella* and *C. plicata*, we consider them as distinct species because they differ in several diagnostic features for the cuspidariids: (1) The anterodorsal margin of *C. tenella* is descending, gently merging with the anterior margin, whereas in *C. plicata* the anterodorsal margin forms a strong shoulder; (2) The posterodorsal margin is strongly oblique in *C. tenella*, but in *C. plicata* it is almost parallel to the anterodorsal axis; (3) The posteroventral sinuation is less developed in *C. tenella* than in *C. plicata*; (4) The external ornamentation of *C. tenella* has conspicuous commarginal striae, which are barely visible in *C. plicata*, which in turn has commarginal waves not seen in *C. tenella*.

Cuspidaria papyria can also be distinguished from *C. plicata* in the presence, in the former species, of a large and elongate rostrum, posteroventral sinuation absent, and a barely perceptible shoulder; *C. plicata* has a shorter rostrum, a marked posteroventral sinuation, a long anterodorsal shoulder, and fewer and more widely spaced waves. In addition, *C. papyria* has a distinctly elongate outline, and the umbo is closer to the anterior margin, whereas *C. plicata* is more rounded, with a central umbo.

***Cuspidaria tamandua* n. sp.**
(Figs. 57–63)

Description: Shell white, small (height, 1–3 mm; length, 2–5 mm), elongate, inequivalve, inequilateral, rostrate, slightly convex. Umbo triangular, projecting. Rostrum large, long. Posterodorsal margin straight, descending, posteroventral margin weakly sinuate, gently merging with ventral margin, anterior margin rounded, anterodorsal margin almost straight, descending. Externally ornamented with indistinct commarginal growth lines, few radial striae present on rostrum. Micropits absent. Hinge edentulous. Resilifer not apparent.

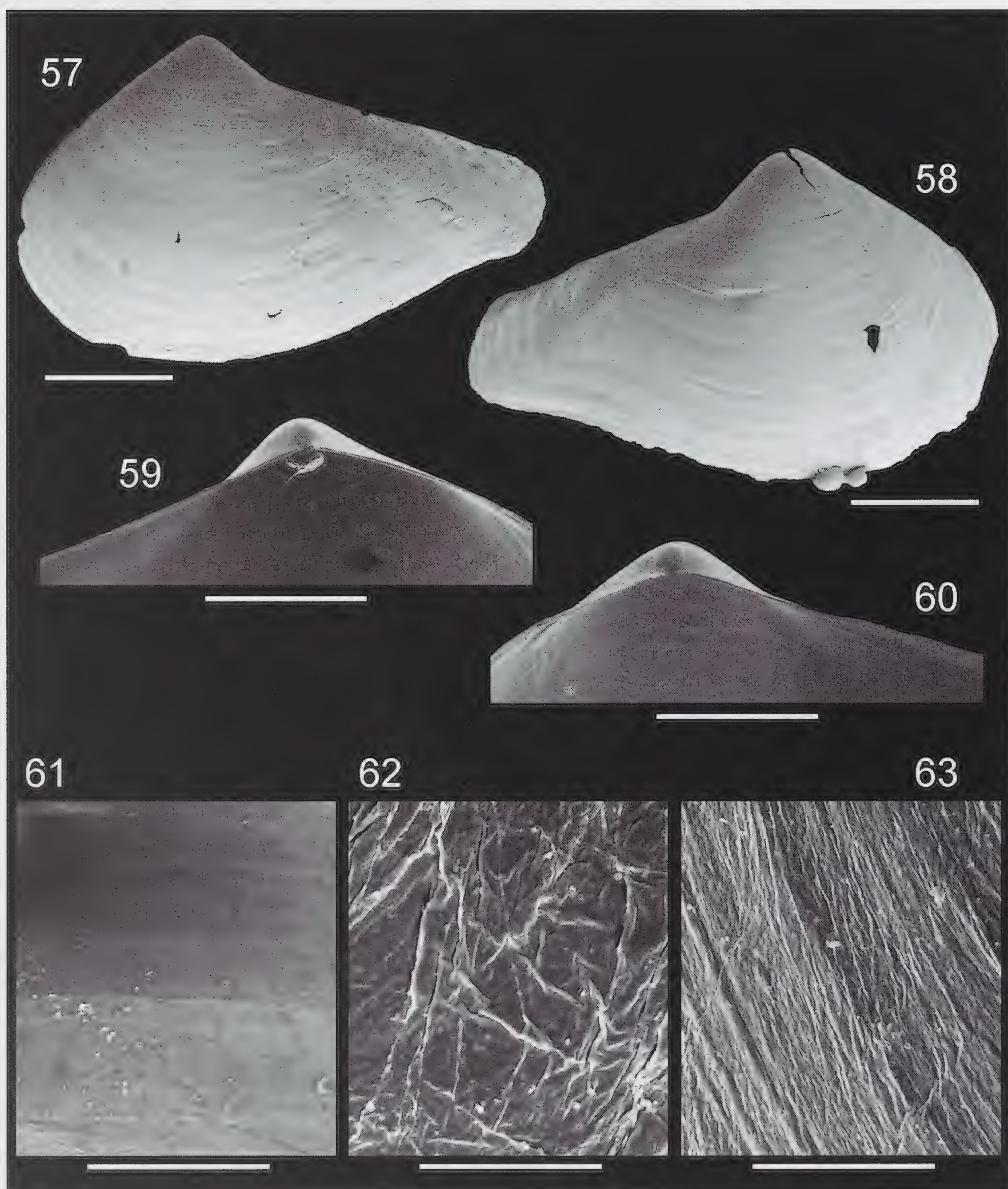
Etymology: This species is named for its shape, which resembles the skull of myrmecophagids (Mammalia: Xenarthra), anteaters from Central and South America. The word “tamanduá” was incorporated into the Portuguese

se language from Tupi, the native language of most Brazilian indigenous peoples. The name is employed as a noun in apposition.

Type Locality: off Campos Basin, Rio de Janeiro state, Brazil. Depth: 1950 m.

Distribution: Only known from type locality. *Bathymetry:* from 1,050 m to 1,950 m.

Type Material: Holotype, IBUFRJ 18790 (22°11'04"S, 39°47'04"W, 1,650 m), 25.XI.02 [1 valve]; Paratypes: IBUFRJ 18791 (22°11'16"S,

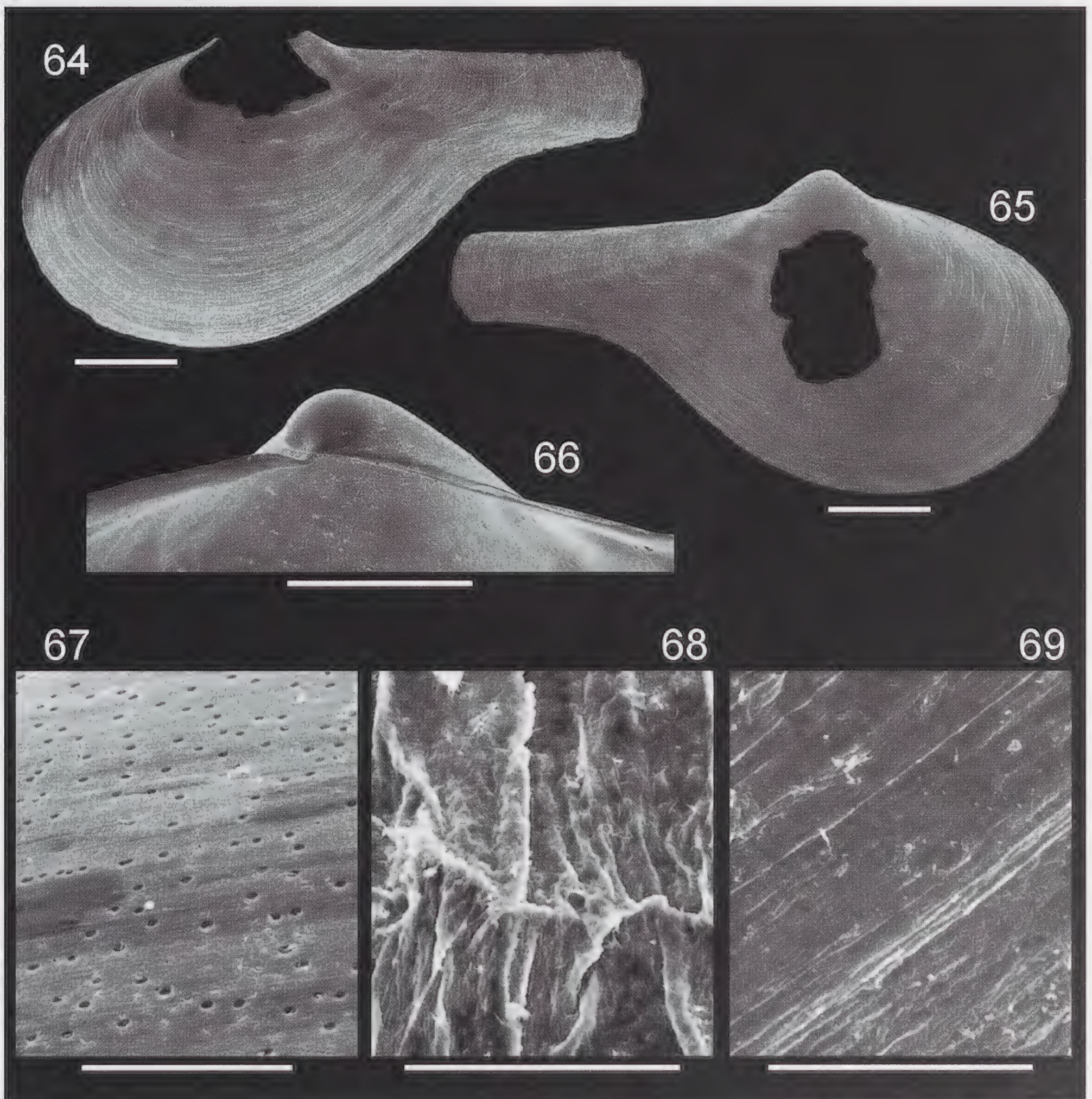


FIGS. 57–63. *Cuspidaria tamandua* n. sp. FIG. 57: Holotype, IBUFRJ 18790, external view, left valve; FIG. 58: Paratype, MCZ 374244, external view, right valve; FIGS. 59, 60: Paratypes, hinge details, left (MOFURG 51171) and right (IBUFRJ 18791) valves, respectively; FIGS. 61–63: Paratype, MNRJ 18729, umbo, rostrum and anterior margin details, respectively. Scale bars: FIGS. 57–60 = 1 mm, FIGS. 61–63 = 100 μ m.

39°43'44"W, 1,950 m), 25.XI.02 [1 valve]; MNRJ 18729 (22°31'37"S, 39°55'14"W, 1,650 m), 16.VI.03 [1 valve]; MZSP 96912 (22°37'02"S, 39°56'20"W, 1,950 m), 13.VI.03 [2 valves]; MOFURG 51171 (22°05'11"S, 39°42'40"W, 1,930 m), 08.V.02 [2 valves]; MCZ 374244 (22°04'45"S, 39°41'58"W, 1,950 m), 27.VI.03 [1 valve]; MNHN (22°31'37"S, 39°55'14"W, 1,650 m), 16.VI.03 [1 valve].

Material Examined: IBUFRJ 18788 (22°09'10"S, 39°44'50"W, 1,930 m), 08.V.02 [1 valve]; IBU-

FRJ 18792 (22°11'16"S, 39°43'44"W, 1,950 m), 25.XI.02 [2 valves]; IBUFRJ 18793 (22°31'28"S, 40°03'50"W, 1,050 m), 19.XI.02, [1 valve]; IBUFRJ 18794 (22°36'03"S, 39°57'54"W, 1,650 m), 16.XI.02, [6 valves]; IBUFRJ 18795 (22°33'10"S, 39°54'22"W, 1,950 m), 23.XI.02 [4 valves]; IBUFRJ 18796 (22°11'16"S, 39°43'44"W, 1,950 m), 22.VI.03 [1 valve]; IBUFRJ 18798 (21°57'26"S, 39°40'34"W, 1,950 m), 27.VI.03 [1 valve]; IBUFRJ 18799 (21°57'26"S, 39°40'34"W, 1,950 m), 27.VI.03 [3 valves]; IBUFRJ 18800 (21°57'26"S,



FIGS. 64–69. *Cuspidaria wapixana* n. sp., holotype, IBUFRJ 18805. FIG. 64: External view, left valve; FIG. 65: External view, right valve; FIG. 66: Hinge details, right valve; FIGS. 67–69: Umbo, rostrum and anterior margin details, respectively. Scale bars: FIGS. 64, 65 = 1 mm, FIG. 66 = 500 µm, FIGS. 67–69 = 50 µm.

39°40'34"W, 1,950 m), 27.VI.03 [3 valves]; IBUFRJ 18801 (21°52'43"S, 39°40'41"W, 1,950 m), 26.VI.03 [2 valves]; IBUFRJ 18802 (22°31'28"S, 40°03'49"W, 1,050 m), 18.VI.03 [4 valves]; IBUFRJ 18803 (22°30'34"S, 39°51'44"W, 1,950 m), 16.VI.03 [2 valves].

Discussion: *Cuspidaria tamandua* n. sp. differs from all previously known species recorded for Brazil in its edentulous hinge, weakly marked posteroventral sinuation, large rostrum, and faintly visible external ornamentation.

The most similar species to *Cuspidaria tamandua* n. sp. is *C. sulcifera*. However, *C. tamandua* n. sp. has a projecting triangular umbo, a descending posterodorsal margin, absence of both an axial ridge and a deep furrow between the rostrum and the disk of the shell, and a simple hinge without a tooth or condrophore, whereas *C. sulcifera* has a blunite umbo, a horizontally oriented posterodorsal margin that is usually slightly pointed upwards, an axial ridge before a deep furrow between the rostrum and the disk of the shell, and an oblique chondrophore on the left valve.

Cuspidaria luymesii (see Knudsen, 2005: 126–128, fig.3) is also somewhat similar to *C. tamandua* n. sp., but differs in the presence, in the former species, of a horizontally oriented posterodorsal margin, a more elongate rostrum, and a long posterior lateral tooth on the right valve.

***Cuspidaria wapixana* n. sp.**
(Figs. 64–69)

Description: Shell white, small (height, 3.1 mm; length, 6.2 mm), elongate, inequivalve, inequilateral, rostrate, convex, umbo triangular, central. Rostrum slender, very long. Posterodorsal margin straight, posteroventral sinuation well marked, ventral margin gently curved, anterior margin rounded, extended, anterodorsal margin slightly oblique. Externally ornamented by commarginal growth lines, rostrum with about four radial striae. Micropits present only on interdissoconch. Hinge edentulous. Resilifer not apparent.

Etymology: This species is dedicated to the Wapixana Native American people, who live in northern Brazil in the Amazon Forest. The name is employed as a noun in apposition.

Type Locality: off Campos Basin, Rio de Janeiro state, Brazil. Depth: 1,930 m.

Distribution: Only known from type locality. Bathymetry: 1,930 m.

Material Examined: Type Material: Holotype, IBUFRJ 18805 (22°09'10"S, 39°44'50"W, 1,930 m), 08.V.02 [2 valves].

Discussion: Unfortunately this species is very fragile and rare, and one of the two valves was damaged during process of taking the SEM photographs.

Cuspidaria wapixana n. sp. differs from *C. tamandua* n. sp. in the presence, in *C. wapixana* n. sp., of a strongly elongate outline and a long, slender rostrum.

Cuspidaria wapixana n. sp. differs from previously known species recorded for Brazil but it has the same general features observed for *C. rostrata* and *C. wollastonii*. However, *C. wapixana* n. sp. differs from both species because: (1) *Cuspidaria rostrata* has a less extended anterior margin and a longer and more slender rostrum; (2) *Cuspidaria wollastonii* has a strong posteroventral sinuation and an inflated shell.

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Our thanks are to Dr. Elena M. Krylova (from P. P. Shirshov Institute of Oceanology) and Dr. Alexander Sysoev (from Zoological Museum of Moscow State University) for the loan of the type material deposited at Zoological Museum of Moscow, to Dr. Michèle Bruni and Dr. Michel Dagnino (both from Oceanographic Museum of Monaco) for the photo of the type of *C. munieri*, to Dr. Ellen Strong and Yolanda Villacampa (both from Smithsonian National Museum of Natural History) for the photo of the type of *C. circinata*, to PETROBRAS (Brazilian Petroleum Co.) for making this material available and for SEM support. This research was partially supported by fellowships from CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior) and CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico).

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